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NSF in Undergraduate Science Education

ALAN T. WATERMAN

Modern Foreign Language Teaching

JAMES M. SPILLANE

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
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The Role of the National Science Foundation in Undergraduate Science Education

By ALAN T. WATERMAN*

THE National Science Foundation has now two programs in support of science education at the undergraduate level. One is the undergraduate science education program. The other is the undergraduate instructional scientific equipment program. Through the first, the Foundation makes possible at colleges, universities, and nonprofit research institutions a number of activities designed to provide special opportunities for the scholarly development of outstanding undergraduates. The objective is to develop new and broader means for able undergraduates to increase, through research participation or independent study, their understanding of science and their ability to employ effective investigative procedures. The undergraduate scientific equipment program is endeavoring to mitigate the shortage of good equipment for scientific instruction at many institutions.

Undergraduate Science Education Program

The undergraduate science education program, initiated in fiscal 1962, grew out of two earlier programs, the undergraduate research participation program and the undergraduate independent study program.

Prior to 1958 no single program within the National Science Foundation focused directly and exclusively on undergraduate science education, although the research divisions of the Foundation provided, and continue to provide, research grants which in some cases include support for undergraduates acting as research assistants. Undergraduate participation in research, however, had long been recognized as a potentially valuable stimulus to undergraduate education in the sciences. After convening several conferences on this subject, in 1958 the Foundation formally set up the undergraduate research participation program. The purpose of this program was to develop new and expanded means of support to enable outstanding undergraduate students of science, mathematics, and engineering to increase their understanding of science and their ability to carry out effective independent investigation of scientific problems.

This program underwent several major changes which somewhat broadened the original concept so as more nearly to satisfy the needs of the various disciplines of science and engineering and to be more flexible in meeting particular institutional situations. Conferences such as those convened to study the curriculums for undergraduate majors in physics and mathematics led to a clearer understanding of the problems the particular disciplines had encountered in initiating such programs as undergraduate research participation for high ability students. The Foundation modified the program so as to incorporate the changes advocated by these conferences.

Another change was made after the proposals for the summer of 1959 and academic year 1959–60 showed that a fundamental difference existed in the type of support needed. One group of faculty members with established research programs, already receiving primary research support from other sources, requested support essentially for participants and

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reimbursement of minimal operating costs incurred by the inclusion of students in their programs. A second group consisted chiefly of younger faculty members of small colleges attempting either to establish new research programs or to enlarge already existing small programs primarily for their educational value to able undergraduates. They indicated a need for both participant and research support. As both kinds of undergraduate participation in research seemed important, the Foundation in 1960 divided the program into undergraduate research participation and undergraduate research training. In fiscal 1961 the two programs were recombined into the single program of undergraduate research participation which permitted full-time summer participation, or part-time participation during the academic year, or a combination.

The undergraduate independent study program was devised and initiated in fiscal 1961 largely in response to the contention of the mathematics community that undergraduate majors in mathematics were capable of independent study of advanced subject matter but were not capable of effective research by themselves or of participating in the solitary efforts of a creative mathematician. The program provided no student support and only very limited operating allowances. Many inquiries were received, but only 24 proposals were submitted. Eleven received support.

After the undergraduate research participation and the undergraduate independent study programs were combined in 1962 under the title undergraduate science education, it became clear that the differences between the various components—independent study, research participation, and research training—are differences not in kind but in degree. There is a continuum in types of students, disciplines, departmental organizations and curriculums, and of research and research support which makes it much more logical to group under the same program all requests for special opportunities for undergraduates of high ability.

Through the undergraduate science education program the Foundation makes grants to colleges, universities, and nonprofit research institutions to provide qualified undergraduates with the opportunity for research or independent study in the mathematical, physical, medical, biological, and engineering sciences. Fields of study must conform to the accepted standards of scientific inquiry by meeting the requirements of objectivity, verifiability, and generality. Thus, social sciences such as anthropology, sociology, psychology, and economics, and the history of science are eligible for support. The extent of participation by the various disciplines during the past 3 years of the program's operation is shown in table 1.

Table 1.—Grants for undergraduate science education: Distributed by field, 1960–62

Field	Grants distributed in—					
	1960		1961		1962	
	No.	*Percent*	*No.*	*Percent*	*No.*	*Percent*
Astronomy	4	0.8	3	0.8	11	2
Biology	109	22	95	27	164	30
Chemistry	152	30	97	27	132	24
Engineering	75	15	44	12	59	11
Geology	22	4	11	3	26	5
Mathematics	14	3	11	3	47	8
Physics	45	9	39	11	61	11
Psychology	18	4	12	3	37	7
Social Science	8	2	6	2	13	2
Multidisciplinary	47	9	39	11	3	0.5

The program has proved adaptable both to the needs of the large university whose faculty is extensively engaged in research and to those of the small college with little research activity and few or no graduate courses. During 4 years of operation, 25 percent of the undergraduate science education grants have gone to large universities with an extensive doctoral program. Approximately 30 percent of the grants have gone to small colleges which offer, at most, a very limited master's degree program. The program makes research experience available to students in virtually every type of educational environment.

Participating undergraduates should be of high academic achievement and well grounded in the basic concepts of their field. Since the aim of the program is to encourage students to pursue further education in the sciences, ideal candidates are those who have demonstrated the scholarly ability, imagination, and perseverance necessary for success in graduate study.

The growing interest of the academic community is evidenced, in part, by increasing requests for support. (See table 2.)

Table 2.—Grants for undergraduate science education, 1959–62

[Amounts in millions]

Year	Requests		Grants		No. of participants
	No.	Amount	No.	Amount	
1959	247	$3.2	213	$1.7	2,205
1960	726	4.1	494	2.9	4,558
1961	546	5.1	357	3.3	4,793
1962	977	16.8	553	4.8	6,510

Initially, the great majority of the requests were for summer or academic year programs. As table 3 demonstrates, however, the trend of undergraduate science education programs and of individual participation is increasingly toward spanning both the summer and the academic year.

Table 3.—Distribution of grants by summer and academic year programs, 1960–62

Year	Percent of programs in—		
	Summer	Academic year	Summer and academic year
1960	47	33	20
1961	40	13	47
1962	24	11	65

It seems probable that this trend will continue as more of the academic community come to recognize the benefits to be derived from a year devoted to intensive research as opposed to those obtainable from a brief 10-week session during the summer or intermittent sessions during the academic year.

Although the 6,510 students supported in fiscal 1962 are only a small fraction of the total number currently enrolled in the sciences (according to the Office of Education, 120,000 bachelor's degrees were granted in the sciences in 1959–60), the impact on the participating institutions, faculty members, and students has been substantial. Project directors have expressed astonishment at the maturity and scientific insight students of high ability have demonstrated when given the opportunity of close involvement in research or independent study. Scientists brought into contact with the interests and needs of young students have shown enthusiasm in assisting the development of the students' scientific potential. This recognition of the students' potential has led many institutions to reevaluate and to update science curriculums.

Although there has not yet been sufficient time for the majority of the students under this program to complete graduate school, there are strong indications that a substantial number have gone on to advanced study and are highly successful in their graduate work.

Undergraduate Scientific Equipment Program

The Foundation is continually reexamining the Nation's science education to determine where the need for support is most urgent. A report supported by NSF, "Estimates of the Costs of Equipment and Materiel Needed to Improve Undergraduate Collegiate Science and Engineering Education in the United States," by Robert W. Krauss, revealed that shortage of good equipment for scientific instruction has prevented many institutions from carrying out their plans for new and improved instruction. The many other demands on the financial resources of undergraduate colleges either preclude the purchase of this equipment or defer it indefinitely. The survey of 474 science and engineering departments disclosed that between $250 and $500 million would be necessary to equip adequately their undergraduate science laboratories.

In 1962 the Foundation initiated the undergraduate instructional scientific equipment program with an allocation of $5 million. The enthusiasm which this program has aroused is evidenced by the number of proposals received in this first year of operation. During fiscal year 1962, 782 institutions submitted 1,124 proposals requesting a total of $16,105,940. Current restrictions on the number of proposals any one institution may submit would have permitted 1,509 proposals from 1,100 institutions. Thus, response was more than 70 percent of the maximum. Funds were available for only 29 percent of the requests submitted.

In general, the Foundation distributed grants fairly uniformly in proportion to the number of baccalaureate degrees in science and engineering awarded during 1959–60. Table 4 shows the grants the Foundation made to applying institutions classified by size and the average number of degrees per grant, calculated on a nationwide basis.

The distribution of funds by States followed closely the distribution of baccalaureates granted in 1959–60 in each State.

Table 4.—Number of science equipment grants made in 1962 to institutions classified by the number of baccalaureate degrees in science awarded in 1959–60, number of institutions in each classification, and average number of degrees per grant

Classification of institutions by number of degrees awarded in 1959–60, and number of institutions in each class	Number of grants awarded	Number of degrees per grant
Over 1,000 degrees: 14 institutions	32	559
750–1,000 degrees: 7 institutions	13	457
500–750 degrees: 32 institutions	49	399
250–500 degrees: 71 institutions	69	368
150–250 degrees: 62 institutions	32	479
Below 150 degrees: 924 institutions	138	399

A total of $5,009,180 was distributed to 263 institutions. The funds were distributed among the disciplines as follows: Biology, 26 percent; chemistry, 24 percent; physics, 23 percent; engineering, 13 percent; computers, 7 percent; earth sciences, 3 percent; social sciences, 3 percent; and mathematics, 1 percent.

It is expected that the undergraduate instructional scientific equipment program will continue for some time at increasing levels. For 1962–63, two closing dates for the receipt of proposals have been established: October 1, 1962, and January 1, 1963. While the massive national need for instructional equipment cannot be eliminated by any modest program, the Foundation's undergraduate instructional equipment program attempts to provide a significant challenge and opportunity for institutions to develop further the quality of their undergraduate science programs.

This program has evoked the interest not only of colleges and universities, but also of the Congress and the President. In his recent message to the Congress on aid to higher education, President Kennedy stressed the importance of the undergraduate instructional scientific equipment program. The Advisory Group on Higher Education specifically recommended to the House Committee on Education and Labor that it be rapidly expanded. The Foundation hopes this program will not only provide equipment to help institutions improve their instructional programs in science but also encourage others to give thought to ways in which the quality of their science instruction can be improved.

The Turn of the Tide

THE LANGUAGE institute program of the Office of Education, authorized under title VI of the National Defense Education Act and presently in its fourth year of operation, was set up to strengthen U.S. language capabilities by improving the language competence of its elementary and secondary foreign language teachers. By June 1963 more than 10,000 of these teachers will have been retrained under this program. One might well ask why these teachers needed to be retrained. The answer will become evident if we take a look at the situation in modern foreign languages in this country which the act was designed to correct. Let us, therefore, first examine the situation existing in the field of modern foreign languages before the passage of NDEA, to make clear the dire need for a vital action program such as the language institutes constitute.

The Modern Language Problem Stated

In pre-NDEA days the United States was the most backward major nation in the world in the vital field of language competence. This was graphically illustrated during World War II, when our linguistic unpreparedness necessitated our spending tremendous sums to train specialists in many languages. We might have assumed that the lesson of World War II would not be easily forgotten. Yet a whole decade after the war a State Department study showed that only one out of four incoming Foreign Service officers had a proficiency in any foreign language. In 1955 only about 15 percent of the Nation's high school students were studying foreign languages and of these the great majority were getting no more than 2 years of study. In 56

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in Modern Foreign Language Teaching

By JAMES M. SPILLANE*

percent of the high schools it was impossible for any student, no matter how gifted or eager, to learn a foreign language for the simple reason that none was included in the curriculum. Whereas a Russian youth was studying a foreign language for 6 of his 10 school years, in the United States less than 1 percent of the elementary school pupils were studying foreign languages. The American pattern was not to begin language learning at the early age most favorable for learning to understand and speak a second language, but at the age of 14–15, and then to attempt the manifestly impossible by providing only 2 years on the average in which to learn to understand, speak, read, and write a foreign language. Of the 24 languages of the world, each spoken natively by more than 20 million persons, only Spanish and French were being studied by any appreciable proportion of American high school students. Of the total enrollment in grades 9–12 in the school year 1954–55, only 7.3 percent of the students were enrolled in Spanish and a mere 5.6 percent in French. More disquieting was the fact that in the USSR 40 percent of all high school and 65 percent of all college students were studying English. In the United States fewer than 10 public high schools out of a total of 25,000 and approximately 1 in 10 of our colleges and universities were offering Russian.

What were 15 percent of our high school students accomplishing in the 2 years of language they normally studied? The only feasible goal for them was a reading knowledge of the language, to the almost total disregard of other and vital aspects of language. Language learning became for the majority a traumatic experience in problem-solving ordeals in grammatical analyses and in tortuous and tortured word-by-word translations of simple materials. High school teaching materials were designed solely for this type of course. To complete the circle and to perpetuate the cycle, most language teachers were being trained exclusively for this approach to language learning.

What accounted for the deplorable state of language study in the United States? Language leaders blamed the longstanding attitude of American professional education toward the modern foreign languages. They could point to the trend in American public education away from content courses and toward a curriculm centered around courses with everyday practical value. As a consequence, modern foreign languages as well as English literature, mathematics, chemistry, and physics suffered.

Yet the language profession itself was far from blameless. The skepticism with which educational administrators and theorists viewed the place of modern foreign languages in the school curriculums was a logical outcome of a lack of clear-cut aims as well as bad pedagogy in the profession. Modern languages entered our curriculums in the wake of the classical tongues and not only inherited the teaching aims and methods of the "dead" languages but also labored under textbooks which were adaptations of those used to teach Latin. Considerations of mental discipline aside, there is nothing duller than learning a living language as if it were a dead one. It is understandable that many an administrator reflecting on his own unpleasant experiences in learning a language took a highly critical view of the value of such an experience. Then, too, apart from teaching and the relatively limited demand for professional interpreters and translators, the direct primary application of foreign language education in a career seemed extremely limited.

William Riley Parker, former executive secretary and president of the Modern Language Association of America, had this to say in 1957 about the training of the language teacher:

> On this subject a book, a very sad book could be written. . . . Those who determine policy in our public schools have, on the one hand, effectively objected to foreign language instruction because it is poorly done and achieves little in two years, and, on the other hand have persistently required an insufficient minimum of foreign language training of the teacher actually hired. Unfortunately, no amount of work in how to teach will increase the fluency or improve the accent or reading knowledge of a foreign language teacher who has not studied languages long enough. In respect to the amount of training he needs in order to be barely adequate, he may or may not be (as some think he is) unique;

but it is certain enough that his deficiencies will be readily apparent and his teaching ineffectual, if he has had no more than the minimum amount of study presently required of him by the department of education in most of our States.

Professor Parker diagnosed the problem very succinctly. It would be well to take a closer look at some of his assertions to show just how dire the situation was.

First of all, among the poorly trained language pupils of the 1920's, 30's and 40's were the language teachers of today, and many of them have perpetuated the type of training they had received. Few were prepared to present language as a living medium of expression, rather than as a process of problem-solving in grammar and translation.

The problem was further intensified by the general tendency to require more and more college work in "professional education" with a resultant decline in the number of traditional "subject matter" courses for the future secondary school teacher of languages. Even more serious was the tendency by State certification boards to evaluate qualifications only in terms of hours and credits. In far too many States a college minor of 15 hours in language was sufficient basis for certification. Is it any wonder, then, that the 2-year course came to be considered terminal in so many high schools? Beyond that point the teacher simply would have exhausted the practical limits of his knowledge of the language.

The liberal arts colleges and universities did little to ameliorate the situation. Confusion was just as rampant regarding the training of future teachers as it was regarding the aims and methods of language pedagogy in general. With some notable exceptions, the budding teacher was allowed to take a disparate array of courses, mostly of a literary nature, which for the most part were of dubious value in preparing him to do an effective job of teaching the language.

Thus the problem that faced the profession before the passage of the NDEA was not the need for more language students, as desirable as this would have been, but rather the pressing need for teachers better equipped to teach their language specialty with demonstrated proficiency in all the linguistic skills. Given well-prepared teachers, confident in their specialty, there would be no problem of interesting students in the study of languages.

The Turn of the Tide

Fortunately, against the background of inadequate teacher preparation and neglect of foreign languages in the curriculums of our schools, the language teaching profession, sparked by the Modern Language Association, was able to organize itself for effective action. In 1952 the Rockefeller Foundation made an initial grant to the Modern Language Association, which resulted in the establishment of the MLA Foreign Language Program. Under the aegis of the MLA, the foreign language teachers examined the problem of what should be done to strengthen and improve language instruction at all levels of American education. The teachers quickly produced an impressive body of reliable information (from which I drew most of my earlier statistics), which not only demonstrated the need for more emphasis on language study, but also stimulated teachers to do some "soul searching" about their own objectives and the methods by which to achieve them. In short, this fruitful collaboration between the MLA and the country's foreign language teachers between 1952 and 1958 was responsible for much of the substance of title VI of the NDEA.

A most significant result of this collaboration was a statement which was officially endorsed by all the national language teaching organizations in America and published in September 1955: "Qualifications for Secondary School Teachers of Modern Foreign Languages." Although its title may seem unprepossessing, its purport is not. It is in effect an agreement by the profession on the "minimal," "good," and "superior" qualifications in the various competencies that every secondary foreign language teacher should possess. The foreign language profession, incidentally, was the first academic discipline in the United States to set up these standards. The specific criteria for teachers of modern foreign languages are: aural understanding, speaking, reading, writing, language analysis, culture, and professional preparation. Of special significance is the statement by the profession which precedes the list of qualifications:

> We regret that the minimum here stated *cannot yet* include real proficiency in the foreign tongue or more than a superficial knowledge of the foreign culture. It must be clearly understood that teaching by persons who cannot meet this minimal standard will not produce results which our profession can endorse as making the distinctive contribution of language learning to American life in the second half of the twentieth century.

With national standards thus set up, the immediate problem was the retraining of the majority of the teachers along the lines of the endorsed

qualifications. In September 1958 the NDEA became law and the machinery for retraining the teachers was incorporated into the language institute provisions of the act.

The authorization is brief. It enables the Commissioner "to arrange through contracts with institutions of higher education for the operation by them of short-term or regular session institutes for advance training, particularly in the use of new teaching methods and instructional materials, for individuals who are engaged in or preparing to engage in the teaching, or supervising or training teachers, of any modern foreign language in elementary or secondary schools." In practice it has resulted in an unusual educational endeavor which, through an integrated pattern of activities, seeks to implement the MLA Statement of Qualifications by upgrading the professional competence of the majority of our foreign language teachers.

Definition and Description of a Language Institute

What, then, is a language institute?

An institute is basically an attempt to recreate as far as possible a foreign milieu and build a foreign cultural island on an American campus. To this end, the participants are given every possible opportunity to hear and to speak the language they are studying. As far as possible courses are taught in the target language. Native speakers are regularly employed on the staff to preserve and to encourage the foreign atmosphere. Conversation at mealtimes is in the language; participants live in "language houses" where the language they are studying is the sole mode of communication; informal activities are conducted in the language; films and lectures are in the language.

To be effective, such a program must be intensive. Formal contact hours run between 30 and 35 weekly. The informal program can account for an additional 15 hours weekly. Summer institutes run from 6 to 10 weeks; the average is 7 weeks. A typical summer institute of 7 weeks' duration, for example, provides more formal contact hours with the spoken language than could be obtained in a normal 2-year college exposure plus complete immersion in it at all other times. This concentration means that a teacher makes far more progress in improving his qualifications as a language teacher than he would by pursuing a normal program of graduate studies for the same period of time.

The basic elements in the formal program of an institute include:

- The principles of applied linguistics as they affect classroom teaching.
- Discussions, lectures, and readings to give the participant an enlightened understanding of the foreign people and their culture, with particular reference to the contemporary scene.
- Professional training to enable the participant to evaluate and use effectively the new methods and techniques of language teaching, as well as the programing for and use of the new electro-mechanical aids to language teaching.
- Demonstration classes of elementary or secondary school students where the new methods and materials are illustrated and practiced.

All of these are related to the problems involved in teaching modern foreign languages in elementary and secondary schools and, therefore, are kept on as practical a plane as possible.

The courses offered in an institute are rarely found in a summer graduate catalogue but are set up specifically for the institute. A truly distinctive feature of the instructional program is that it does not consist of a series of disparate courses having no relationship one with the other, but is rather an integrated program in which each phase illuminates or complements the other. The program in a given institute is set, in that electives are rare; yet it must be flexible enough to meet the individual needs of the participants by allowing them to concentrate on the areas where they need most help.

Also contributing to the effectiveness of an institute are the common objectives of both the staff and the participants. The relationship between staff and participants is usually much less formal than is customary. A language institute has a multitude of needs and responsibilities vastly different from those of the usual summer session. The lecturer in a regular summer session may perhaps teach 2 hours a day and then retire to the library, his home, or the lake. This is absolutely not the case with the teacher in a language institute. His responsibilities encompass far more than a certain number of class contact hours. He is responsible for assisting in all kinds of remedial work and extracurricular duties. As a consequence, his actual workload is much greater than that of the normal summer session instructor. But since the staff normally works full time with the institute and the ratio of staff to participants is a favorable one, a refreshing *esprit de corps*, which seems to develop from these circumstances, adds greatly to the effect of the institute.

The institute is entirely supported by the Government and can thus be a self-contained unit set apart from the host institution's regular program. The result is a highly effective training program for teachers, which, in the normal order of things, could not be duplicated on any college campus. I might also add that proposals for institutes are entertained from any accredited college or university. However, the potential of the program and its consonance with the objectives of the NDEA, the promise of the staff, and the adequacy of the instructional and physical facilities at the institution are the governing factors in the eventual selection of institutes. Thus, institutes are held both at big, "name" universities as well as at small liberal arts colleges.

Story of the Institutes

The program started in the summer of 1959 with a modest appropriation of $1,584,000, enough funds to establish 12 summer and 4 academic year institutes during the academic year 1959–60. This summer there are 80 summer institutes in operation and 5 academic year institutes are scheduled for the coming academic year, with a total appropriation of $7,250,000, the ceiling set by the act. It is estimated that by June 1963 the total number of teachers trained in NDEA institutes, by languages, will be: Chinese 55; French 4,595; German 1,421; Italian 96; Japanese 20; Modern Hebrew 45; Russian 642; Spanish 4,611. Of these, 1,479 will be teaching at the elementary level and 10,006 at the secondary level.

A key phase in the program has been the provision of "second-level" opportunities for carefully selected first-year trainees who show promise of superior attainment and leadership. Second-level institutes are normally held in the country of the target language, and by the end of this summer 988 teachers will have attended such institutes in France, Germany, Latin America, Puerto Rico, and Russia. The advantages to the participants of studying in the country whose language they teach are obvious. The programs of these institutes are just as intensive as their domestic first-level counterparts, embracing courses on an advanced level in linguistics, culture, methodology, directed conversation, oral practice, phonetics, and writing. This summer, second-level institutes are being held in France, Germany, the Soviet Union, Argentina, Ecuador, Mexico, and Puerto Rico. The second-level Russian institute is being held for the first 5 weeks at Indiana University and the concluding 5 weeks in the Soviet Union. The travel costs for these second-level programs are borne by the participants.

The statistics of the program are impressive. Well over 10,000 individual elementary and secondary school teachers of the common as well as of some of the uncommon languages will have been trained by June 1963. Yet at the present time there are approximately 30,000 foreign language teachers just at the secondary level alone in this country. As to the number of language teachers at the elementary level, there are no exact figures available. Certainly the number must be considerable. With the impending explosion in the school population and the definite rise in the popularity of language study at all levels in the schools, more and more teachers of varying proficiency in the languages they teach will be pressed into service. Not all of the teachers mentioned above will need training of an institute nature, of course. However, it should be obvious that the job is far from done.

Influence of the Institutes

That the impact of the language institute program on foreign language teaching has been tremendous was attested to early in the program by an independent evaluation team, under the direction of Dr. Stephen Freeman of Middlebury College, Vermont, which visited all the summer institutes in 1959 and again in 1960. Here are a few significant paragraphs from the 1960 report:

> The summer Language Institutes of 1959 had been, to a very large degree, pilot projects; and the very idea was a bold experiment. The thirty-seven Summer Institutes of 1960 were a dynamic and positive achievement. They gave some two thousand modern language teachers unprecedented experience—in professional stimulus, in upgrading of language competence, and in cultural enrichment. They amplified and extended the impact of the 1959 institutes, creating a new spirit in the country about the teaching of modern languages. They contributed toward meeting the rapidly increasing demand for better trained, more competent secondary school and grade school teachers of modern languages. Nearly all these Institutes were successful, many of them oustandingly so; all rendered a real service. Only a few had grave defects. Almost without exception, the participants have gone back to their classrooms fired with enthusiasm to do a better job, stimulated by watching new procedures in action, more fluent and more correct in their oral use of the foreign language, and with a very considerable

baggage of professional information, instructional materials, and even prepared exercises and taped recordings. . . .

Many new and interesting techniques were developed for instruction. The approaches to the problem of teaching applied linguistics were many and varied. Much progress was made in the equipment and utilization of laboratories. The demonstration classes became the central core of instruction in methods. Not only were the programs of these Institutes unlike the usual summer schools; they differed widely among themselves; and they were unlike anything which many of the participants, or even many of the faculty members, had ever experienced before. Varying degrees of success were achieved in various aspects, but the program of the Institutes is not fixed in a stereotype pattern. It is ready for new and vigorous experimentation in 1961.

But certainly the most convincing evidence of the impact of the program is provided by the numerous letters which have reached the Language Institute Section from grateful teachers who have gone through institutes. They note a gratifying increase in language skills and knowledge of subject matter as a result of the institute experience. They go back to their schools, they say, with a sense of confidence and a renewed enthusiasm in teaching which results in better teaching and more interested students. Many indicate their resolve to go on to do further advanced work on their own and especially to travel or study in the country whose language they teach. In their letters they indicate a new awareness of professional obligations, a point William Riley Parker underscores:

> Many of our foreign language teachers are inadequately trained, overworked, and underpaid. Most of them feel depressed and frustrated a great deal of the time. Less than half of them belong to any national organization that can give them a sense of being part of an active, unified profession, through attendance at meetings, reading of pedagogical journals, work on committees, and other means of encountering new ideas. . . . And yet a new spirit is now stirring in them. Surprised, even bewildered, they are beginning to realize that they have an important role to play in the national interest. They were told so by their State and national leaders from 1952 on, but it took the National Defense Education Act of 1958 to make them really believe. In their developing professional consciousness lies the only real hope. *The National Interest and Foreign Languages* (3d. ed.).

These letters offer a subjective evaluation of the efficacy of the institute training. Objective proof of the quality of their training, however, is provided by the MLA proficiency tests, developed under an NDEA contract. The tests, administered at the beginning and again at the end of each institute since the summer of 1960, cover the seven basic competencies mentioned earlier. Results of the tests given to approximately 3,600 teachers in the 1961 summer institutes offer the firm statistical evidence that they had made excellent progress in each of the seven competencies. Quite remarkable progress was noted in speaking, cultural knowledge, and methodology.

These tests, now ready for general use by the profession, represent the first effort by an academic community to identify and standardize their own competencies on a national scale. The tests are proficiency tests and, as such, reflect the growing dissatisfaction with the pattern of American education which has tended to determine qualifications on the basis of hours and credits instead of demonstrated knowledge and proficiency of a specific sort. Since the nature of foreign language learning is such that it involves—in the mastery of the listening, speaking, reading, and writing objectives—the learning of a skill as differentiated from learning subject matter, it is essential that the degree of competency in these areas be measured qualitatively. We may hope that the day may not be too far distant when scores on these tests will become part of the certification requirements for all foreign language teachers.

The language institute provisions of the act specifically state that language teachers must be given "advance training, particularly in the use of new teaching methods and instructional materials." The "new teaching methods" are those which present language as a living thing and not as a dead subject. The objective of modern language learning now is total communication, listening comprehension, speaking, reading, and writing—and in that order of acquisition. This is commonly referred to as the "audiolingual" approach to language learning. It presupposes an exclusively aural-oral phase of audiolingual instruction before the graphic aspects of the language are presented and is designed to develop in the learner habits of accurate hearing and reproduction of the new language's phonetic system with a minimum of interference from his own. During this prereading phase structural patterns, phrases, expressions, and their combinations and recombinations are learned and, in fact, overlearned, until they become automatic. When the time comes for reading it is a question of introducing the learner to the written representation of utterances he already commands. Thus the learner makes an easy transition to reading in the foreign language. By having

the learner copy what he has learned to recognize, the transition to writing has been effected and the process of introducing the total language has been completed.

Prior to the passage of the NDEA no texts organized along strictly audiolingual lines were available. The NDEA Language Development Program was thus faced with the crucial task of creating such materials for use in the demonstration classes of the institutes. These pilot materials, originally called the "Glastonbury Materials," because they were created by the Glastonbury Public Schools, Connecticut, under contract with the Office of Education, represented the collaboration of language teachers at all levels and linguistic scientists and were enthusiastically received by the participant-teachers in the institutes. They are now published under commercial auspices, and have met with such ready acceptance by language teachers throughout the country that 140,000 secondary students are now using them. Publishers have learned from this that there is a market for good audiolingual materials.

By June of 1963 approximately one million elementary and secondary school pupils will have benefited from the instruction their teachers have received in NDEA language institutes. The implications of improved quality of instruction, more enthusiastic students, and the resulting longer sequences of foreign language instruction, as the role of foreign language in our Nation's defense becomes more patent, are far-reaching. The impact of the NDEA on modern foreign language enrollments in high school is certainly suggested by the increase of 16.4 to 19.1 percent in the single year from 1958 to 1959. As more and more elementary school teachers of languages are trained by the program the position of FLES (Foreign Languages in the Elementary Schools) will become assured. The ideal of an unbroken sequence of language instruction from the primary grades through the secondary level, although still distant, seems now at least within the realm of possibility. But the past neglect of foreign languages as well as the prospect of giving languages the importance in our curriculums that Congress and the public now want will create problems that will take more than the NDEA to solve.

Conclusion

There are some significant implications here for higher education. The language institute program is essentially a "retreading" operation, but how long should it continue to retread foreign language teachers? Certainly one of the main reasons for such a program is to remedy the deficiencies in the preservice preparation of the teacher. Some enthusiasts have urged that in the future all modern foreign language teachers get their training at institutes instead of in colleges and universities. I cannot, however, imagine anyone entertaining such a notion seriously. Certainly the institute program is not the final answer to the Nation's need for better foreign language teachers. The proper training of teachers is not the function of language institutes—it is the responsibility of colleges and universities. The real question, then, is not how long the language institute program will last, but what are American colleges and universities doing now to insure that the foreign language teachers trained by them will not need subsequent training of an institute nature.

In this connection it should be noted that in many instances language institutes have had an impact on the language curriculums as well as on the teacher-training program of the host universities and colleges. A survey conducted by the MLA among college presidents whose institutions had conducted language institutes indicated that new materials are being adopted; more stress is being put on the understanding, speaking, reading, and writing sequence; increased and more intelligent use is being made of language laboratories. There is, in short, very good evidence that college faculties are becoming more and more interested in shifting their teaching emphasis to an audiolingual approach and in revising radically their teaching methods.

As beguiling as these developments are, especially in view of the teacher-training situation in pre-NDEA days, they certainly are no cause for complacency. Frankly, and I am saying this as a college language teacher, it does not seem that a sufficient number of colleges and universities are providing the type of training that will eventually render the NDEA language institutes superfluous. The country needs more and more foreign language teachers. However, if these teachers are going to have to attend NDEA institutes after graduating from college, it certainly seems that a wholesale revision of teacher-training curriculums is in order. This is the most serious problem that the modern language profession now faces.

Office of Education Studies and Surveys

College and University Enrollment and Facilities Survey 1961–65

COLLEGES AND UNIVERSITIES expect to increase their instructional accommodations by 41.2 percent and their residential accommodations by 51.3 percent between fall 1961 and fall 1965, according to early responses to an Office of Education survey now being completed.

This expansion, estimated by the institutions to cost $7.5 billion, will be possible only if the institutions borrow $2.5 billion, find the funds to provide the $1.2 billion whose source was indicated as "unknown," and receive $1.5 billion from gifts, $310 million from the Federal Government, and $2 billion from State, local, and other sources. Thus, it is evident that the expansion plans are extremely optimistic.

The 1,473 institutions which have responded indicated that by 1965–66 they plan to furnish instructional facilities for 2,575,935 full-time undergraduate students and 235,586 graduate students, or an increase of 41.2 percent over the number of full-time students accommodated in 1960–61. Latest projections of degree-credit enrollment, however, forecast an increase of 44.1 percent during the same period.

In 1960–61 instructional facilities were sufficient to accommodate 1,833,672 undergraduate full-time students at 1,434 institutions and 157,920 full-time graduate students at 469 institutions. However, 141 institutions were overcrowded to the extent of 37,535 undergraduate students and 17 were overcrowded to the extent of 5,629 graduate students. Although the net result was an aggregate unused capacity for 174,040 additional full-time students, or a margin of 8 percent of the number accommodated in 1960–61, these unused accommodations were not freely available to students denied admission to overcrowded institutions: some vacancies were in technical and specialized schools such as theological schools, some were in all-men's or all-women's schools, and many were in institutions which had no available space in residence facilities.

Additional residential accommodations which responding institutions expect to have ready by fall 1965 would increase the number accommodated by 51.3 percent and raise the combined percentage of full-time students accommodated from 39.7 percent in 1960–61 to 42.6 percent in 1965–66. In public institutions the increase would be from 34.6 percent to 37.4 percent, and in private institutions from 47.3 percent to 50.7 percent. These increases, however, would still be insufficient to take care of the students seeking accommodations. For example, in the fall of 1960, some institutions reported a shortage of residential accommodations amounting to 39,863 units, while other institutions reported 22,014 vacancies.

Other data gathered for the 1960–61 academic year showed that privately controlled institutions housed 47.3 percent of their full-time students, while publicly controlled institutions housed 34.6 percent of theirs. Whereas public institutions enrolled 59 percent of all full-time students, they accommodated only 50.9 percent of all single men housed on campus and 50.3 percent of all single women housed. Public institutions did, however, house 75.4 percent of all married couples. Of the total units of residential accommodations provided on all campuses of responding institutions, 50.4 percent were used by single men, 44.2 percent by single women, and 5.4 percent by married couples.

Nearly 79 percent of the responding institutions plan construction of 6,103 new buildings in the 5-year period 1961–65. Of these new buildings, 43.3 percent are to be for instructional purposes, 5.1 percent for research, 11.6 percent for general purposes, 30.4 percent residential, and 9.6 percent for other auxiliary purposes. Total cost will be $6,264 million, of which $3,567 million will be spent by 410 responding public institutions for 3,116 new structures and $2,697 million by 733 private institutions for 2,987 new structures. In proportion to the total buildings planned, public institutions are placing greater emphasis on instructional and research facilities while private institutions are emphasizing residential and other auxiliary functional types.

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National Defense Education Act Notes

OE Contracts for Instructional Television Libraries

A NATIONAL Instructional Television Library, the first ever to be attempted, will be set up under a $261,504 contract recently awarded to the National Educational Television and Radio Center by the Office of Education under title VII of the National Defense Education Act. This project is the outgrowth of the increasing use of instructional television by schools and colleges and the development of a large number of recorded television courses. The library will expedite the exchange of the best television instructional courses among schools, institutions of higher education, and educational television stations throughout the country. The contract extends through June 1, 1963. Further information is available from Edward Cohen, Acting Director, National Instructional Television Library, National Educational Television and Radio Center, 10 Columbus Circle, New York, N.Y.

Previously, the Office of Education had announced the beginning of two regional instructional television libraries which are to be coordinated with the National Library. It awarded a contract totaling $113,200 to the University of Nebraska for the establishment of the Great Plains Regional Instructional Television Library. Courses on videotapes should be available to the central States from this library in time for the academic year 1962–63. Information is obtainable from Paul H. Schupbach, Director, Great Plains Regional Instructional Television Library, University of Nebraska, Lincoln 8, Nebr.

A second library, designed to meet the needs of elementary and secondary classrooms, will serve the Eastern Seaboard area. The Office awarded a contract totaling $59,570 to the Eastern Educational Network for the establishment of the Northeastern Instructional Television Library. It is expected that courses on videotape will be available from the library by January 1, 1963. Further information may be obtained from Michael Ambrosino, Executive Director, Northeastern Instructional Television Library, Eastern Educational Network, 238 Main Street, Cambridge, Mass.

The three libraries will work together in seeking to encourage testing by the Nation's educational institutions of the economic feasibility and the educational desirability of sharing videotape and kinescope instructional materials through the mechanism of a rental library.

New Director of Title VI Program Appointed

D. LEE HAMILTON has been named director of the Language Development Branch of the Division of College and University Assistance in the Office of Education, succeeding Dr. Kenneth W. Mildenberger whose appointment as director of the division was announced in the March issue of *Higher Education*. As director of the branch, Dr. Hamilton will be responsible for the administration of the modern foreign language fellowship, research and studies, institutes, and centers programs. His appointment took effect on May 7.

Before assuming his new duties, Dr. Hamilton served for 5 years as associate dean of the School of Languages of the Foreign Service Institute of the Department of State and for 7 years as academic dean at the Army Language School, Monterey, Calif. Before this he had been professor of Romance languages at Indiana University and at the University of Texas, and had introduced and taught Portuguese at the Naval Academy, Annapolis.

Dr. Hamilton holds a B.A. from Baylor University, an M.A. from Northwestern University, and a Ph. D. from the University of Chicago. He is the author of three textbooks in Portuguese and numerous articles and book reviews.

1,500 Graduate Fellowships Awarded

THE COMMISSIONER of Education has awarded 1,500 graduate fellowships under title IV of the National Defense Education Act for study beginning in 1962–63. These fellowships, most of which are for 3 years, are tenable in 571 approved programs at 157 graduate schools located in all States, except Alaska, and the District of Columbia.

Awards made since the inception of the program in 1959 now total 5,500. As the 1,000 graduate fellows who entered graduate school in 1959 have

now completed their 3-year tenure, approximately 4,500 fellows will enroll under this program in the fall of this year. They will be studying in 813 programs at 165 graduate schools. These schools will receive in 1962–63 about $10.3 million to help pay for the cost of the new and expanded graduate programs in which the fellows are studying.

In nominating students for awards, the graduate schools with approved programs are required to give preference to students that are preparing to become college teachers. The 5,500 fellowships thus far awarded have been for study in the following basic academic areas: Humanities, 25 percent; social sciences, 26 percent; education, 8 percent; biological sciences, 14 percent; physical sciences, 17 percent; engineering, 10 percent.

Other Program Notes

Fulbright-Hays Programs Announced

THREE PROGRAMS of grants for 1963–64 are announced under the Fulbright-Hays educational exchange program.

▸ The Institute of International Education (IIE) has announced that more than 800 scholarships will be made available to American students for graduate study or research in 46 countries during the 1963–64 academic year. The graduate student scholarship program is administered by the IIE for the Department of State.

Three types of grants are available. A full U.S. Government grant provides roundtrip transportation, maintenance, tuition, and books. These awards are available for study in Argentina, Australia, Austria, Belgium-Luxembourg, Brazil, Burma, Ceylon, Chile, Republic of China, Denmark, Ecuador, Finland, France, Federal Republic of Germany, Greece, Iceland, India, Iran, Ireland, Italy, Japan, Korea, the Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Portugal, Spain, Sweden, Turkey, United Arab Republic, and the United Kingdom (including overseas territories).

A joint United States-other government grant provides a travel award from the U.S. Government in conjunction with foreign government grants which provide tuition and full or partial maintenance. These joint awards are available for study in Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Poland, Rumania, Panama, Paraguay, Peru, and Venezuela.

The third type of award, travel-only grants, supplements a scholarship received from a foreign government, university, or private donor. Travel-only awards are available for study in Austria, Denmark, France, Germany, Israel, Italy, and the Netherlands.

Eligible students must be U.S. citizens, have a bachelor's degree, be proficient in the language of the country in which they are to study, and be in good health. Preference is given to applicants under 35 years of age who have not previously lived or studied abroad.

Applications for scholarships for 1963–64 will be accepted until November 1, 1962. Requests for applications must be postmarked by October 15. Students enrolled at a college or university should consult their campus Fulbright Program adviser. Others who are interested may write to the Information and Counseling Division, Institute of International Education, 800 Second Avenue, New York 17, N.Y., or to any of IIE's regional offices.

▸ The Conference Board of Associated Research Councils has announced the 1963–64 program of university lecturing and advanced research abroad and the summer 1963 program of institutes in Asian civilizations, both of which it administers on behalf of the Department of State and the Board of Foreign Scholarships.

Under the 1963–64 program of university lecturing and advanced research study, awards are available in Europe in Austria, Belgium/Luxembourg, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, and the United Kingdom and colonial territories; in the Near East in Cyprus, Iran, Israel, Turkey, and the United Arab Republic; in the Far East in the Republic of China, Japan,

Korea, and the United Kingdom territories; and in South Asia in Nepal. Awards under this program available in Latin America, Australia and New Zealand, and South and Southeast Asia, for which the deadline was April 15, were announced earlier this year.

Eligibility requirements, in addition to U.S. citizenship and in certain cases a knowledge of the host country, are, for lecturers, at least 1 year of college teaching experience; for research, a doctoral degree or recognized professional standing.

Under the 1963 summer institutes in Asian civilizations program, two seminars for undergraduate teachers will be held in Indian and Chinese civilizations. The Institute in Indian Civilization will be held at Osmania University, Hyderabad, India, and the Institute in Chinese Civilization at Tunghai University, Taichung, Taiwan. Both are 8-week institutes, lasting from late June through August, and are designed to give participants an intensive survey of Indian or Chinese history, institutions, and culture. The 20 grants offered for the Indian institute and the 30 for the Chinese cover tuition and roundtrip travel.

In the selection of applicants, preference will be given to persons under 50 years of age holding a doctorate in either the humanities or social sciences who have had no previous experience in Asia but have a reasonable background of reading on some aspect of Asian history or culture; special consideration will be given to candidates from institutions which are trying to develop or improve courses in Asian studies.

Applications under either of these programs should be submitted not later than August 1, 1962. Forms of application and further information may be obtained from the Conference Board of Associated Research Councils, Committee on International Exchange of Persons, 2101 Constitution Avenue, Washington 25, D.C.

U.S. Loan Program for Cuban Students

CUBAN REFUGEES attending U.S. institutions of higher education will again be able to borrow funds from the U.S. loan program for Cuban students to finance their college education this summer. It is estimated that about $170,000 will be loaned to 420 students.

This specialized program, established in February 1961 and administered by the National Defense student loan program, is designed to help Cuban nationals who have no support from sources inside Cuba to continue their education. Since the beginning of the program about $1 million has been made available to over 1,000 Cuban students attending 149 institutions participating in the program. The number of Cuban students needing assistance for the coming summer session is expected to be about 70 percent greater than last summer. Funds for the 1962–63 academic year have not yet been made available.

NIH Activities

THE NATIONAL Institutes of Health (NIH) recently announced the following activities:

• The adoption of a new procedure to deal with problems which arise from grant-supported work relating to patentable discoveries and inventions. Under this procedure an "annual invention statement" must now accompany every request for renewal of NIH grant support and every final research progress report. Although formal reports of inventions will still be required, the new statement will serve as a regular reminder to grantees and officials of sponsoring institutions of their obligation to report all such discoveries and inventions. The continuing growth and development of the NIH research grant and training programs have brought about an increase in the number and complexity of problems in patents administration and this has made the new procedure necessary. Details concerning it are available from the Division of Research Grants, National Institutes of Health, Bethesda 14, Md.

• The establishment of a Division of Research Facilities and Resources, effective July 15, 1962. Frederick L. Stone, currently acting chief of the Division of General Medical Sciences, will head the new division and Clinton C. Powell, presently assistant director of the National Institute of Allergy and Infectious Diseases, will become chief of the Division of General Medical Sciences. The new division will centralize the administration of some of the major NIH activities and programs which provide broad support to the Nation's biomedical research institutions. It will be responsible for the following programs and activities: The health research facilities construction program; the program of support for primate centers; the general clinical research

centers program; the special resource centers program; and the general research support grant program.

• The opening of a new overseas branch office in Rio de Janeiro, Brazil, to administer research activities in Latin America. The Rio de Janeiro office will represent NIH in negotiations with Latin American institutions engaged in medical research, collect information on medical research potential and needs, advise NIH grantees, and assist NIH advisory groups by visiting sites of institutions that are proposing research projects for NIH support. It will also negotiate with scientists and government officials of Latin American nations in connection with cooperative research agreements. A European office, also a part of NIH's Office of International Research, was opened in Paris last December.

• The transfer of the National Library of Medicine from Cleveland, Ohio, to a new building on the grounds of NIH at Bethesda, Md. The 125-year-old library contains 35,000 volumes valued at $6 million, the world's greatest collection of medical literature.

• A deadline of September 21, 1962, for applications under the clinical fellows, clinical associates, and research associates programs for appointments starting July 1964 and later. Detailed information on these programs and application forms may be obtained from the Clinical and Professional Education Branch, Clinical Center, NIH, Bethesda 14, Md.

• A total of 12,890 research grants and 2,801 fellowship awards amounting to $314,588,104 made by the Public Health Service during the first 10 months of fiscal year 1962. The total includes new grants, fellowships, and research career awards in addition to continuations of previously approved awards.

College Housing Program During FY 1962

THE COLLEGE HOUSING program gave final approval to 246 applications by colleges and universities for loans totaling $292 million during the first 3 quarters of the current fiscal year. During the same period it gave preliminary approval to an additional 204 applications amounting to $238.6 million. Included in these totals are $173.6 million in approved loans and $27.7 million in funds reserved for pending applications for funds for "service facilities" such as college unions, separate dining halls and cafeterias, and in-and-out-patient health facilities. Total commitments since the inception of the program in 1951, including active reservations of funds, amount to $1.9 billion.

During the same 9-month period, hospitals with approved nursing schools or approved intern and residency programs submitted 19 applications totaling $10.8 million for loans to house student nurses, interns, and residents. Fifteen applications amounting to $7.8 million were approved, and 10 received reservations of funds totaling $6.7 million. Since 1959, when hospitals first became eligible to apply for loans for these purposes, a total of 80 loans amounting to $39.8 million have been approved.

New York State leads the States which have made the most use of the college housing program with a total of approved loans and reservations amounting so far to $169.6 million, followed by California with $123.7 million and Texas with $106.9 million. All of the 50 States and Puerto Rico have participated in the program.

The "liberalizing" amendments introduced by Senator Fulbright to the Housing Act of 1950 included one extending the maximum term of college housing loans from 40 to 50 years. However, in practice, the term has been confined to 40 years, until recently when Sidney H. Woolner, Commissioner of the Community Facilities Administration, announced that where the college or university wished to take advantage of the longer term of repayment and it appeared to be necessary and desirable to do so, the loans could be amortized over a 50-year period. This will permit a reduction of about 8 percent in the rentals necessary to amortize a loan on a self-liquidating basis.

Technical Report Centers Selected

TWELVE UNIVERSITIES and libraries have been selected by the National Science Foundation and the U.S. Department of Commerce as Regional Technical Report Centers to make more widely available the unclassified results of federally sponsored research and development. The Office of Technical Services of the Department of Commerce will direct and coordinate the planning and operation of the system, and the NSF, through its Office of Science Information Service, will provide funds and other assistance for getting the program under way.

The Department of Defense, the National Aeronautics and Space Administration, and the Atomic Energy Commission, which together produce an

estimated 90 percent of the Government's unclassified technical reports, have agreed to provide copies of their reports for deposit in each of the 12 centers.

This new system is designed to ease the long-standing problem of how to disseminate results of federally sponsored research to the scientific and technological communities. Heretofore there has been no reliable and systematic means by which U.S. scientists and engineers could obtain access to a complete and organized collection of the Government's unclassified scientific and technical reports.

The centers will organize and maintain a cumulative library collection of all technical reports and bibliographic and reference publications received and will furnish to the general public in their respective geographical regions such services as personal reference, interlibrary loans, and photocopies.

The centers were selected on the basis of such factors as geographic distribution, proximity to major concentrations of scientific, industrial, and education activities, convenience of access, availability of adequate transportation and accommodations for transient visitors, availability of required library facilities and resources, willingness and capability of the library to cooperate fully in performing the services required, and experience in handling scientific and technological report-type literature.

The Office of Technical Services will coordinate operation of the system for maximum efficiency, foster participation by other Federal agencies, and serve as a central liaison agency for the Federal Government in administering and operating the system.

The 12 centers and the regions they cover are these: Carnegie Library of Pittsburgh (serving Kentucky, Ohio, Pennsylvania, and West Virginia); Columbia University, New York (serving Connecticut, New Jersey, and New York); Georgia Institute of Technology, Atlanta (serving Alabama, Florida, Georgia, Mississippi, South Carolina, and Tennessee); John Crerar Library, Chicago (serving Illinois, Indiana, Michigan, Minnesota, and Wisconsin); Library of Congress, Washington (serving Delaware, District of Columbia, Maryland, North Carolina, and Virginia); Linda Hall Library, Kansas City (serving Arkansas, Iowa, Kansas, Missouri, and Nebraska); Massachusetts Institute of Technology, Cambridge (serving Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont); Southern Methodist University, Dallas (serving Louisiana, Oklahoma, and Texas); University of California, Berkeley (serving Hawaii, Nevada, and northern California); University of California, Los Angeles (serving Arizona and southern California); University of Colorado, Boulder (serving Colorado, New Mexico, North Dakota, South Dakota, Utah, and Wyoming); and the University of Washington, Seattle (serving Alaska, Idaho, Montana, Oregon, and Washington).

New PHS Policy Regarding Research Grants

UNDER A NEW POLICY, the Public Health Service (PHS) will support research performed for it by profit-making institutions solely on a contract basis.

Of the more than 15,000 current grants, totaling almost $400 million, the majority are to universities and other nonprofit institutions. Forty-eight of the grants, totaling approximately $1.3 million, are, however, to profit-making organizations. These are now under review by PHS. In all cases where it is determined that the grantee organization is a profit-making institution, PHS will, upon the termination of the current grant, either discontinue its support or continue it on a contract, as opposed to a grant, basis.

Indirect Costs of Federally Sponsored R & D in Colleges and Universities

INDIRECT COSTS, or "overhead," of federally sponsored research and development in colleges and universities will amount to an estimated $175 million in fiscal year 1962, the National Science Foundation has reported in its bulletin *Reviews of Data on Research and Development*, No. 32 (see "New Publications"). About 47 percent, or $83 million, of the estimated $175 million represents the indirect costs of federally sponsored research grants, while the rest covers indirect costs of Federal research and development contracts.

The bulletin points out that under current Federal practices $47 million of the $83 million in indirect costs of research grants will come from the Government and an additional $36 million represents the required contributions from the colleges and universities themselves. Comparable figures for indirect costs of federally sponsored research grants in fiscal year 1960 were an estimated $43 million, $22 million

coming from the Government and $21 million from the colleges and universities.

U.S. Colleges To Assist Central American Education

THE AGENCY for International Development (AID), under its Alliance for Progress program, has granted $200,000 to the Superior Council of Universities of Central America so that it may contract with U.S. colleges and universities to assist in organizing and amplifying basic science departments in the universities of Costa Rica, Guatemala, Honduras, El Salvador, and Nicaragua. The Superior Council (*Consejo Superior Universitario Centro-Americano*) established in 1959, is composed of the five university rectors, with a permanent secretariat under the direction of Carlos Tunnermann Bornheim.

Under the contract, funds will be used to purchase laboratory equipment, plan classroom construction and laboratory lay-out, and develop or extend programs in biology, chemistry, mathematics, and physics. Russell G. Davis, formerly AID adviser in educational research and planning in Latin America, is currently coordinating the program.

The program is the first of several which AID is carrying out on a regional basis in the Central American Republics. It will be closely coordinated with similar programs funded by other U.S. agencies, Ford and other foundations, the Organization of American States, and UNESCO.

AID is now inviting expressions of interest by U.S. colleges and universities who may wish to participate in the Superior Council's program.

Renaissance and Reformation in U.S. Modern Foreign Language Teaching

MODERN FOREIGN LANGUAGE teaching in the United States is undergoing at once a renaissance and a reformation. Prof. William Riley Parker, in the revised and expanded edition of *The National Interest and Foreign Languages* (see "New Publications"), goes far beyond a mere updating of the facts and figures given in the two earlier editions which appeared in 1954 and 1957; he makes clear both the quality and the quantity of the current upsurge of language learning and urges the clarification of American objectives in language study "with the national interest put firmly above the vested interests of either foreign language teachers or their competition in our thousands of schools and colleges."

The figures themselves are impressive: an increase from 14.2 to 19.1 percent in modern foreign language enrollment in public high schools between 1954 and 1959; an increase of approximately 700,000 studying these languages in the elementary schools during the same period; and, at the 4-year college level, an increase in modern foreign language enrollment from approximately 17 percent of the total institutional enrollment in the fall of 1958 to approximately 20 percent in the fall of 1960.

But of deeper ultimate significance is the reformation that is taking place in the methods, quality, and aims of language teaching, supported in large part by the operation of titles III, VI, and VII of the National Defense Education Act. With the emphasis now on the initial control of the spoken language and on the audiovisual method of instruction, new teaching materials of every kind ranging from pictures and recordings to teaching machines and language laboratories are being provided under the act. At the same time language institutes are improving the quality of teaching in the elementary and secondary schools by providing teachers with new methods of language instruction and improved fluency in the language, and fellowships and centers are adding to the national reservoir of persons proficient in the uncommonly taught languages and strengthening instruction in these languages and related studies at the undergraduate and graduate levels.

In addition to the new material introduced at various points throughout the text, the author in an envoy ventures 19 "considered predictions" of the shape of things to come in language study in the United States as seen from the vantage point of late 1961. Here they are:

- The *audiolingual* (listening-speaking) approach to foreign language teaching will be generally adopted at all levels, and it will bring students more quickly and surely to *direct reading* (without decoding) which in turn will make literary analysis and appreciation possible at an earlier stage.
- More attention will be paid, in language teaching, to *listening comprehension* as a primary, *separable* learning process basic to speaking skill and motivating it.
- *Audiovisual* "machines" will make it possible for the foreign language teacher to instruct *more*

beginning pupils, but in *smaller* classes, in the same number of contact-hours as now.

• *Informal* education (travel, international conferences, organizations, TV, radio, the press, movies, libraries) will play an ever-increasing part in foreign language learning—as, indeed, in other aspects of formal education.

• Both *Latin* and *German* will stage a striking comeback in American education, and *Portuguese* will vie with Spanish in popularity at all levels.

• A semi-independent *National Language Foundation* (comparable to the National Science Foundation) will be established and financed by Congress, entrusted with (among other things) the development of a large reservoir of native Americans with mastery of foreign languages, and with continuing research and experimentation on language learning.

• There will be promising experimentation with *preschool* foreign language learning by means of disc recordings, tape, and TV, and there will be research on the sociological and linguistic effects of this experience upon the *subconscious* mind.

• Research will prove that second-language learning can safely and profitably begin as early as *kindergarten or the first grade*, and many elementary schools will introduce a foreign language informally at this level, soon coordinating and confirming the experience with the learning of numbers and with certain aspects of social studies.

• *Eight- and ten-year sequences* of foreign language study will become common in the public schools.

• *Foreign language high schools* will be established in many of our larger cities, accepting those who have demonstrated linguistic aptitude in elementary school, and teaching *in* a foreign language many of the normal high school subjects.

• Senior-year *refresher* courses in foreign languages for the college-bound will be offered in all but the smallest high schools.

• *Study abroad* for credit, before the senior year, will become common in American high schools, public and private.

• The better colleges and universities will *require demonstrated proficiency* (not high school "units") in a foreign language for entrance, and demonstrated proficiency in a *second* foreign language (often non-Western) for graduation.

• The liberal arts objectives of foreign language study will become, in ascending order of importance, literary analysis, knowledge of a foreign literature, knowledge of a foreign culture, and *knowledge of the nature of language*. (The last will be most stressed, not only because of its educational value, but also because it expedites the learning of additional languages as the student later finds need for them.)

• Most major universities will offer instruction in 40 to 50 different languages.

• University language and area centers will add the *historical* dimension, and the more important ancient *languages* will be studied by many.

• *Certification* of all elementary and secondary school teachers of foreign languages will depend upon scores made in proficiency testing of the four language skills and other factors, and, unless the skills have been otherwise acquired, a college "major" in a foreign language will (as a minimum) be expected of all persons intending to teach it. (*College* teachers, since they will be responsible for training those teaching at lower levels, will be required to demonstrate *superior* proficiency in the four language skills, including near-native accent and fluency.)

• Study of *contrastive structural analysis* (English compared with a specific foreign language) will be required of all future language teachers.

• *Graduate research* for the Ph.D. in a foreign language will encompass, not only literary history and literary analysis (as now), but also pure and applied linguistics, and language teaching methodology.

AEC Establishes Education Division

THE CHAIRMAN of the Atomic Energy Commission has established a Division of Nuclear Education and Training. The division will administer education and training programs in nuclear science and engineering, the use of radioisotopes in the physical and engineering sciences, radiation biology and the life sciences, health physics, industrial medicine, and industrial hygiene.

The new director of the division is Russell S. Poor, provost of the J. Hillis Miller Health Center of the University of Florida and former chairman of the University Relations Division of the Oak Ridge Institute of Nuclear Studies. In addition to responsibilities in program administration, Dr. Poor will be responsible for developing and maintaining Commission policies pertaining to education and training and for reviewing and coordinating all

Commission programs on education and training.

Dr. Poor received his B.S., M.S., and Ph. D. degrees in geology-chemistry from the University of Illinois. He has held teaching and administrative positions at the University of Florida, Auburn University, Birmingham-Southern College, and the University of Illinois.

State Academies of Science To Receive Grants From NSF

In academic year 1962–63 the National Science Foundation will make 55 grants totaling $609,945 to State academies and comparable institutions in 37 States, the District of Columbia, and Puerto Rico for the improvement of science education.

The major part of the funds will be applied to projects designed to meet the educational needs of secondary school students, teachers, and, in a few cases, undergraduates, chiefly through visiting scientist programs. The rest of the funds will be used for the expansion of junior academies of science, short-term teacher courses, student seminars, and experimental methods in science education.

American Studies Courses Abroad

The international educational exchange program sponsored by the U.S. Government and now a part of the U.S. Department of State program authorized by the new Fulbright-Hays Act (Public Law 87–256, 87th Congress) has been in operation for over 15 years. One result of this binationally administered program has been the special impetus given to American studies in countries overseas.

Last year, of the 1,025 American professors and teachers who taught in universities and schools abroad under this program, 272 conducted courses in some phase of American studies. They taught such subjects as American literature, American history, American government and economics, and American philosophy, and introduced the U.S. experience in such courses as modern history, English language and literature, comparative government, law, journalism, and other fields in the social sciences and humanities. Of the 3,477 foreign scholars, teachers, and students who came to the United States under this program during the same period, 747 came to study the same American subjects.

A relatively recent development under this program has been the establishment of chairs of American literature and history at a number of European universities. They are occupied by members of their own faculty, who offer courses in American subjects. Some of these universities have been able to strengthen their libraries and research materials through financial support from private American foundations. Courses in American subjects are being offered for the first time in universities in other areas of the world.

The Department of State has initiated a program of grants-in-aid to American universities for cooperative interuniversity arrangements through which the American institution provides faculty and leadership to a sister university abroad interested in establishing a chair in American subjects. These projects are developed directly by the two participating universities, and the grants are made directly to the institutions, chiefly in foreign currencies available under the Fulbright-Hays Act and the Agriculture Trade Act of 1954 (P.L. 480, 83d Congress). In some cases a grant made straight to the foreign university has enabled it to appoint a national of the country to occupy the new chair.

During the past year, through the initiative of cooperating universities here and abroad and with financial support under this program, 11 chairs of American studies have been or are being established in 8 countries. The most recent of these is a chair in American studies at the University of Madrid, Spain, established under the guidance of a faculty committee of Harvard University. Other chairs recently established are: in economics, at the University of Rio Grande do Sul in Brazil, assisted by the University of Wisconsin; in American literature, at the University of Osmania, India, by the University of Minnesota; in American history and institutions, at the University of Bombay, India, by the University of Pennsylvania; in American history, at the University of the Philippines, by the University of Washington; and at Hebrew University and Tel Aviv University, Israel, in American literature, through direct grants to these two universities.

Training and Study Grants for Teachers of the Deaf

The Office of Education has made awards in amounts ranging from $5,673 to $96,007 to 38 institutions in 25 States and the District of Columbia

under a new program of grants by the Federal Government to colleges and universities for providing and improving courses of training and study for teachers of the deaf.

These are the first awards made under this 2-year program, which was authorized by Public Law 87–276 and is administered by the Office of Education. The program provides grants-in-aid to institutions of higher education (1) to assist them in establishing and improving courses of training for teachers of the deaf, and (2) to establish and maintain scholarships for qualified persons desiring to enroll in such courses of training and study.

Congress has authorized $3 million for expenditure under this program during the coming 2 years. During this first year over 400 scholarships are being offered at a total cost of over $1 million and grants-in-aid to the value of more than $300,000.

NSF Surveys Show Nation Spent $80 Billion for R&D During 1950's

ABOUT $80 billion was spent for research and development in the United States in the decade 1951–52 through 1960–61, four times the estimated amount spent in the preceding 10 years.

In 1953–54, when the National Science Foundation began making surveys of annual data on transfers of R&D funds, the total was $5.2 billion. Since then the totals have steadily increased to $14 billion in 1960–61. An additional $15 billion is estimated for 1961–62.

The NSF surveys show sources and users of R&D funds in the Federal Government, industry, colleges and universities, and other nonprofit institutions and include R&D in the natural sciences but not the social sciences. Earlier bulletins in this series cited figures for individual years only. Bulletin No. 33, *Reviews of Data on Research and Development*, "Trends in Funds and Personnel for Research and Development, 1953–61" (see "New Publications"), for the first time breaks down the national R&D total for each of the 8 years 1953–54 through 1960–61 into funds for basic research, applied research, and development, and gives the sources of the funds in each case.

Some of the highlights of bulletin No. 33 are:

- In 1959–60, $1.2 billion went for basic research, $2.8 billion for applied research, and $8.6 billion for development, making a total of $12.6 billion.
- The Federal Government's contribution of funds for R&D both within and outside its own laboratories, increased from about half the total in 1953–54 to two-thirds the total in 1960–61.
- Fund transfers for basic research, the primary concern of the NSF, increased from $432 million in 1953–54 to $1.3 billion in 1960–61. This indicates a larger percentage increase than that shown for all R&D over the same period.
- Total R&D expenditures and basic research funds during the period 1953–54 through 1960–61 grew faster than the total national expenditures for goods and services as measured by the gross national product.
- The total number of scientists and engineers conducting R&D in 1954 was 223,200: Federal Government 29,500; industry 164,100; colleges and universities 25,200; other nonprofit institutions 4,400. In 1960 the total had increased to 387,000: Federal Government 41,800; industry 286,200; colleges and universities 52,000; other nonprofit institutions 7,000. These figures include: for the Federal Government, civilian personnel only; for the other three categories, professional research personnel employed on projects conducted under contract with Federal agencies.

Federal Contract System To Be Studied

THE Carnegie Corporation has added a $200,000 grant to its support of a 3-year study begun last October by Brookings Institution, Washington, D.C., of the effects of the great increase in the number and variety of U.S. Government contracts with universities, business firms, and nonprofit research organizations. The study is concerned with contracts for research, development, testing, evaluation, managerial services, and technical assistance and grant programs, but not with contracts for the production of goods.

Brookings Institution is exploring the question of how and why the contract system has developed so rapidly and evaluating its significant effects on the capacity of the national Government to direct and administer large and complex programs. It will also determine the effect of Government contracts on private organizations, including colleges and universities, and on the Federal civil service system and Government employment policies. Clarence H. Danhoff, formerly professor of economics at Tulane University, is directing the study.

Korean War Veterans Under GI Bill

MORE THAN 1,200,000 veterans of the Korean Conflict had, by the end of calendar year 1961, gone to college under the Veterans Readjustment Assistance Act of 1952.

Of these, 201,000 studied business administration, 163,000 studied engineering, and 139,000 prepared for teaching. First choice of the GI engineering students was electrical engineering, followed by mechanical and then civil engineering. The majority of those who prepared for teaching careers studied general education but several thousand studied in such specialized fields as industrial arts and physical education.

Other courses that veterans chose included: Medicine and related professions, 53,000; science 45,000; law, 44,000; business courses, 42,000; social sciences, 40,000; and the ministry, 13,000.

The law requires that all education and training of nondisabled Korean veterans be completed by January 31, 1963.

NEW PUBLICATIONS

Government Publications

How To Obtain

(*1*) *Cost Publications: Send request, enclosing remittance (check or money order), to the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.*

(*2*) *Free Publications: Request direct from the agency issuing them.*

From the Office of Education

Bachelor's Degrees in Science and Mathematics Expected for 1961–62 and Junior-Year Enrollments in Science, Mathematics, and Foreign Languages, by Wayne E. Tolliver. Washington, U.S. Department of Health, Education, and Welfare, Office of Education, June 1962. 6 p. (OE–54021–62)

Education Directory 1961–62, Part 4: Education Associations, prepared by Bobbie Doud. Washington, U.S. Government Printing Office, 1962. 122 p. 50 cents. (OE–10001–62)

Education for Freedom and World Understanding: A Report of the Working Committees of the Conference on the Ideals of American Freedom and the International Dimensions of Education, March 26–28, 1962. Washington, U.S. Government Printing Office, 1962. 62 p. 30 cents. (OE–10016)

Summarizes the deliberations of the 140 leaders in education who attended the conference convened by the Commissioner of Education and held at the Office of Education "to consider the state of American education in the light of our traditional ideals of freedom and the present need for achieving a larger understanding of other cultures." The report consists of an introductory statement on the conference and three major sections: "Fundamentals of Freedom," "Immediate Tasks," and "Looking Ahead." An appendix contains, in addition to a list of conference participants, the text of the addresses delivered to general sessions of the conference by Commissioner of Education Sterling M. McMurrin, Assistant Secretary of State for Educational and Cultural Affairs Philip H. Coombs, and Secretary of Health, Education, and Welfare Abraham Ribicoff.

Financial Assistance for College Students: Undergraduate, compiled by Richard C. Mattingly. Washington, U.S. Government Printing Office, 1962. 360 p. $1.25. (OE–55027)

A directory of institutional scholarships and loans (including National Defense student loans) and oncampus employment opportunities available during the 1959–60 academic year at 1,677 institutions of higher education listed in the *Educational Directory, Part 3: Higher Education, 1959–60.*

Lists institutions alphabetically by State and gives a brief description of each institution and of its financial aid programs. Two appendices give general information about National Defense student loans and list institutions reporting National Defense student loans as the only form of student financial assistance they offer.

Publications of the Office of Education, 1962, prepared by Beryl Parke. Washington, U.S. Department of Health, Education, and Welfare, Office of Education, 1962. 66 p. (OE–11000B)

Lists about 500 publications currently available for sale to the public through the Government Printing Office. Includes many new titles as well as recent editions of annually issued surveys providing data and forecasts concerning finances, enrollment, staff, curriculum, and facilities of public schools and colleges and universities.

Salaries and Fees in Land-Grant Colleges and State Universities, 1961–62, by W. Robert Bokelman and Louis A. D'Amico. Washington, U.S. Department of Health, Education, and Welfare, Office of Education, March 1962. 9 p. (OE–52004–1)

(See *Higher Education*, April 1962, p. 17.)

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Science Facilities Planning Aids, by E. Eugene Higgins, Mary B. Fuller, and Dorothy M. Jones. Washington, U.S. Department of Health, Education, and Welfare, Office of Education, March 1962. 15 p. (OE–51004–2)

The second in the College and University Physical Facilities Series (see "New Publications," May 1962, *Inventory of Higher Education Physical Facilities*). Includes a list of science buildings, by State and institution, reported to have been occupied for the first time during the 1948–57 decade and a science facilities planning bibliography.

The Teaching Internship Program, by Henry Harap. Washington, U.S. Department of Health, Education, and Welfare, Office of Education, November 1961. 7 p. (OE–58004)

Title VI National Defense Education Act: The Language Development Program. Washington, U.S. Department of Health, Education, and Welfare, Office of Education, January 1962. 8 p. (OE–50026)

A leaflet summarizing the origin, purpose, scope, and implementation of title VI of the NDEA.

From Other Government Agencies

MLA Selective List of Materials for Use by Teachers of Modern Foreign Languages in Elementary and Secondary Schools, Mary J. Ollman, *ed.* Prepared and published by the Modern Language Association of America under a contract with the U.S. Office of Education, 1962. 162 p. $1. Copies are available from the Modern Language Association Foreign Language Program Research Center, 70 Fifth Avenue, New York 11, N.Y.

This revised and expanded version of the *Materials List for Use by Teachers of Modern Foreign Languages*, published in 1959, lists, briefly describes, and evaluates 1,850 items for the teaching of French, German, Italian, Modern Hebrew, Norwegian, Polish, Portuguese, Russian, Spanish, and Swedish. Items are grouped by language and type of material and cover the whole range of instructional materials from basic texts, grammars, and dictionaries through discs, tapes, and films to maps, periodicals, and teachers' course guides. Three appendices contain (1) selected and annotated bibliographies on the French, German, Hispanic, Italian, Luso-Brazilian, and Russian cultures, (2) criteria used in evaluation of the materials, and (3) sources of the materials listed. A preliminary section covers items relating to all 10 languages.

National Institutes of Health Grants and Fellowships: Review and Approval Procedures. Washington, U.S. Department of Health, Education, and Welfare, Public Health Service, 1962. 11 p. (Public Health Service Publication No. 909)

Briefly outlines the way in which funds are awarded to medical schools, colleges, universities, hospitals, and other scientific institutions to support research, training, and the construction and equipping of new and modernized research facilities.

The National Interest and Foreign Languages: A Discussion Guide, prepared by William Riley Parker for the U.S. National Commission for UNESCO, Department of State. Washington, U.S. Government Printing Office, March 1962. 159 p. $1. (Department of State Publication 7324) See page 19.

The Peace Corps Volunteer: A Statistical Summary. Washington, The Peace Corps, March 1962. 76 p.

Summarizes in tabular form data as of March 31, 1962, concerning Peace Corps Volunteers by categories including occupational skills, geographic distribution by State of residence and area of project, sex, language knowledge and skills, level of education, and previous experience, and gives totals of Volunteers trained, selected, assigned overseas, and returned to the United States.

Reviews of Data on Research and Development, No. 32, "Indirect Costs of Research and Development in Colleges and Universities, Fiscal Year 1960." Washington, U.S. Government Printing Office, March 1962. 6 p. 10 cents. (National Science Foundation) See page 19.

Reviews of Data on Research and Development, No. 33, "Trends in Funds and Personnel for Research and Development, 1953–61." Washington, U.S. Government Printing Office, April 1962. 8 p. 10 cents. (National Science Foundation, NSF 62–9.) See page 22.